UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 9517

MSAS NO. 105

OVER THE

SOUTH CHANNEL OF THE ST. LOUIS RIVER

DISTRICT 1 - CARLTON COUNTY, CITY OF CLOQUET

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 69)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 9517, Piers 1 and 2, were found to be in good condition with no structurally significant defects observed. Since the last inspection, minor nodular corrosion has developed on the steel pipe piles. There was also a light accumulation of timber debris at the upstream end of both piers. The riprap covered bedrock channel bottom was stable with no significant scour present.

INSPECTION FINDINGS:

(A) The steel pipe piles exhibited minor coating failure and up to 1/2-inch-diameter rust nodules over 5 to 10 percent of the surface area with no related section loss.

(B) A minor accumulation of timber debris was observed on the channel bottom at the upstream end and randomly scattered throughout both piers.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 9517

Feature Crossed: The South Channel of the St. Louis River

Feature Carried: MSAS No. 105

Location: District 1 - Carlton County, City of Cloquet

Bridge Description: The superstructure consists of three spans of prestressed concrete beams. The superstructure is supported by two reinforced concrete abutments and two steel pipe pile piers. The piers are labeled Piers 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matt J. Lengyel

Date: August 31, 2002

Weather Conditions: Sunny, 70E F

Underwater Visibility: " 3 Feet

Waterway Velocity: "0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers consist of one line of four steel pipe piles drilled 6 feet into bedrock supporting a reinforced concrete cap.

Maximum Water Depth at Substructure Inspected: Approximately 9.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pile cap at the west side of Pier 1.

Water Surface: The waterline was approximately 5.3 feet below reference.
Waterline Elevation = 1179.9 feet.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

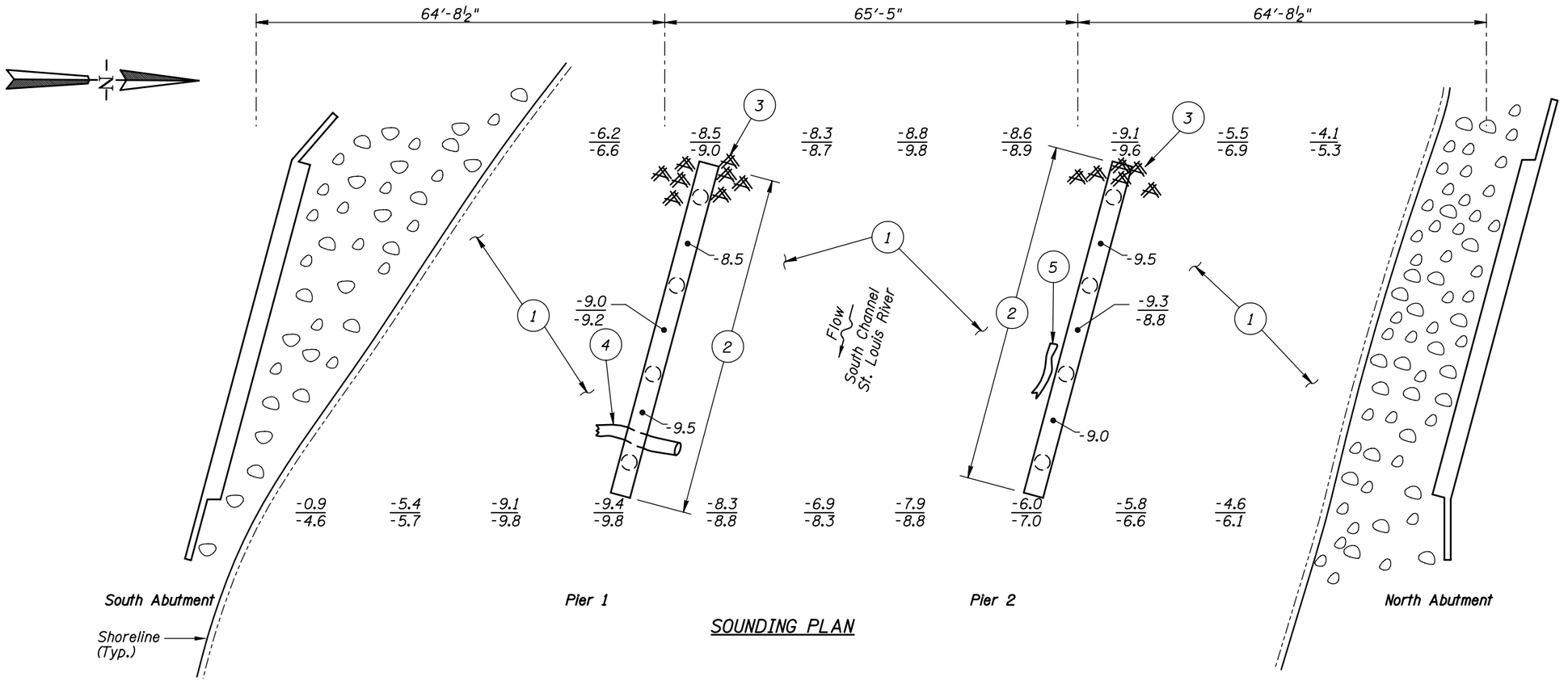
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/02

Item 113: Scour Critical Bridges: Code F/97

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

____ Yes __X__ No



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 31, 2002, the waterline was located approximately 5.3 feet below the top of the pier cap at the upstream end of Pier 1. This corresponds with a waterline elevation of 1179.9 based on the previous report dated August 24, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

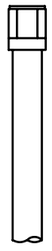
(1) The channel bottom material consisted of 1- to 3-foot-diameter riprap with no probe rod penetration.

(2) The steel pipe piles exhibited minor coating failure and up to 1/2-inch-diameter rust nodules over 5 to 10 percent of the surface area with no related section loss.

(3) A minor accumulation of 4-inch-diameter and smaller timber debris was observed on the channel bottom at the upstream ends of both piers.

(4) An 8-inch-diameter log was observed on the channel bottom.

(5) A 6-inch-diameter log was observed on the channel bottom.



TYPICAL END VIEW OF PIERS

Legend

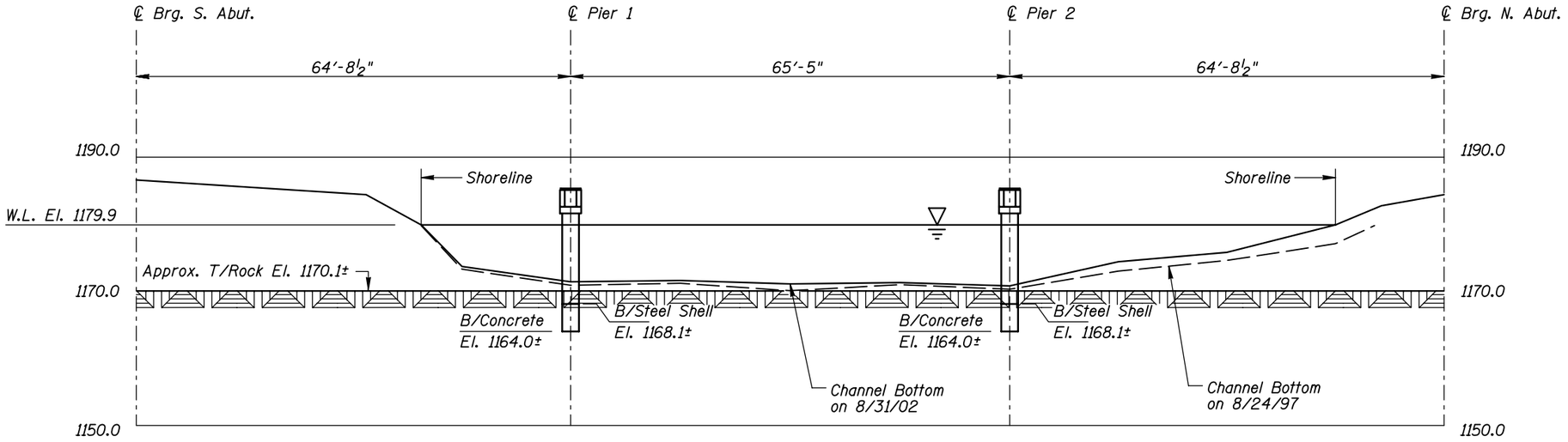
-2.0	Sounding Depth from Waterline (8/31/02)
-5.2	Sounding Depth from Waterline (8/24/97)
◯	Steel Shell
	Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

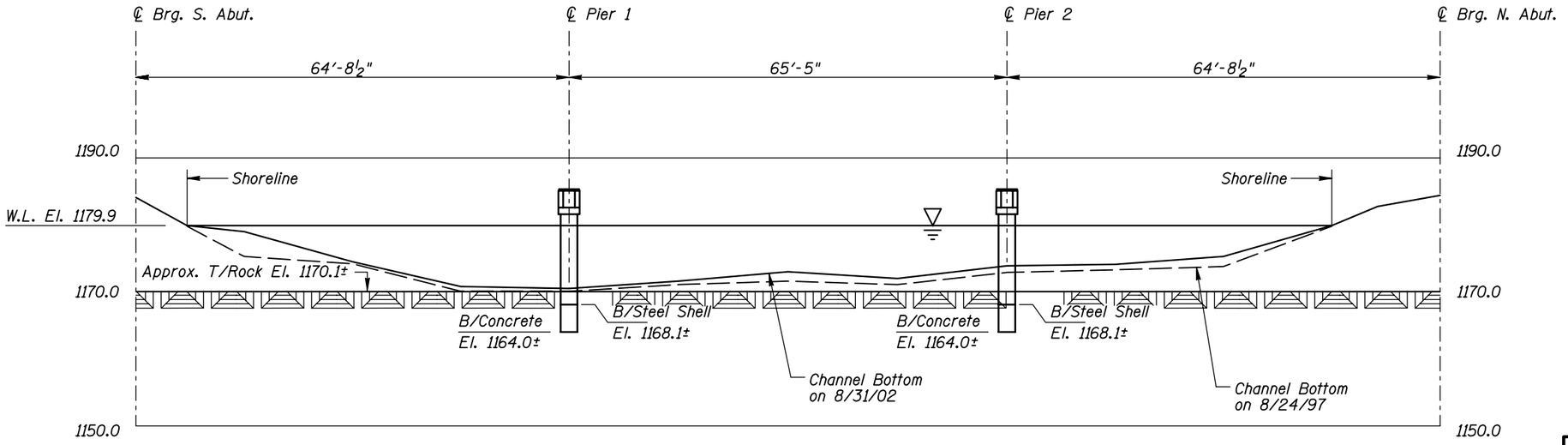
STRUCTURE NO. 9517
OVER THE SOUTH CHANNEL OF THE ST. LOUIS RIVER
DISTRICT 1, CARLTON COUNTY, CITY OF CLOQUET

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120069		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Notes:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 9517
OVER THE SOUTH CHANNEL OF THE ST. LOUIS RIVER
DISTRICT I, CARLTON COUNTY, CITY OF CLOQUET

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=20'
Code: 35120069		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Northwest.

Photograph 2. View of Pier 1, Looking Northwest.

Photograph 3. View of Pier 2, Looking Southwest.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 31, 2002

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 9517 * WEATHER: Sunny, "70E F

WATERWAY CROSSED: The South Channel of the St. Louis River.

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Michelle D. Koerbel, Matt J. Lengyel

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 10:20 A.M.

TIME OUT OF WATER: 10:45 A.M.

WATERWAY DATA: VELOCITY "0.5 f.p.s.
VISIBILITY "3.0 feet
DEPTH 9.5 feet maximum at Piers 1 and 2.

ELEMENTS INSPECTED: Piers 1 and 2.

REMARKS: Overall, the submerged substructure units were in good condition with no significant structural defects observed. The steel pipe piles exhibited minor coating failure and up to 1/2-inch-diameter rust nodules on 5 to 10 percent of the surface area with no related section loss. The channel bottom consisted of rip-rap and appeared to be stable. A light accumulation of timber debris on the channel bottom was observed at the upstream end and randomly scattered throughout both piers.

FURTHER ACTION NEEDED: _____ YES ____X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

* Location of former Bridge No. 6019

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 9517
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The South Channel of the St. Louis River

INSPECTION DATE August 31, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	9.5’	7	N	N	9	N	7	7	N	N	7	7	N	7	N	N	N	
	Pier 2	9.5’	7	N	N	9	N	7	7	N	N	7	7	N	7	N	N	N	

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged substructure units were in good condition with no significant structural defects observed. The steel pipe piles exhibited minor coating failure and up to 1/2-inch-diameter rust nodules on 5 to 10 percent of the surface area with no related section loss. The channel bottom consisted of rip-rap and appeared to be stable. A light accumulation of timber debris on the channel bottom was observed at the upstream end and randomly scattered throughout both piers.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.